What is claimed is:

1. A gas plasma emission source comprising:

a resonant cavity; and

a solid state power source coupled to the resonant cavity.

Sub B1

2. The emission source of claim 1, further including a cable coupled between the solid state power source and the resonant cavity.

3. The emission source of claim 1, wherein the resonant cavity includes a tube disposed through the resonant cavity.

4. The emission source of claim 1, wherein:

the solid state power source couples into the resonant cavity sufficient power to sustain a plasma in a gas disposed within the resonant cavity, the sufficient power being less than 300 watts;

the plasma constitutes a fluctuating load on the solid state power source; and

the sufficient power is substantially stable with respect to the fluctuating load.

5. The emission source of claim 4, wherein the sufficient power is less than 100 watts.

6. The emission source of claim 1, wherein the solid state power source includes an oscillator coupled to a solid state power amplifier.

7. An atomic emission detector comprising the emission source of claim 1 and a spectrographic detector disposed to sense atomic emissions from a gas within the resonant cavity.

8. The detector of claim 7 wherein:

the resonant cavity has a tube disposed along an axis;

the gas enters the tube from one end of the tube, another end of the tube being an open end; and

the spectrographic detector is disposed to sense atomic emissions emitted from the open end.

9. The detector of claim 7, further including a cable coupled between the solid state power source and the resonant cavity.

10. The detector of claim 7, wherein:

the resonant cavity includes a tube disposed through the resonant cavity; and

the tube comprises one of a fused silica tube and a sapphire tube.

11. The detector of claim 7, wherein:

the solid state power source is coupled to the resonant cavity to provide sufficient power to sustain a plasma in the gas within the tube, the sufficient power being less than 300 watts;

the plasma constitutes a fluctuating load on the solid state power source; and

the sufficient power is substantially stable with respect to the fluctuating load.

Sub B2

12. The detector of claim 11, wherein the sufficient power is less than 100 watts.

13. The detector of claim 7, wherein the solid state power source includes an oscillator coupled to a solid state power amplifier.

14. A method of sustaining a plasma comprising steps of:

passing a gas through a resonant cavity; and

exciting the resonant cavity with signal power from a solid state power source to sustain the plasma in the gas.

15. The method of claim 14, wherein the step of exciting includes exciting the resonant cavity with signal power that is less than 300 watts.

16. The method of claim 14, further comprising a step of sensing a wavelength of radiation emitted from the plasma.

17. The method of claim 14, further comprising a step of sensing an intensity of radiation emitted from the plasma.

Sub B3

18. A method of using a solid state power source, comprising steps of:

passing a gas through a resonant cavity; and

coupling sufficient signal power from an output of the solid state power source to sustain a plasma in the gas, the sufficient power being less than 300 watts.

19. The method of claim 18, further comprising a step of sensing a wavelength of radiation emitted from the plasma.

20. The method of claim 18, further comprising a step of sensing an intensity of radiation emitted from the plasma.